
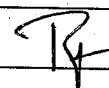


PLANNED SYLLABUS COVERAGE (Theory)

| Govt. Polytechnic Kinnaur | | Department: Applied Sciences | | Subject :Applied Physics-II | | |
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| | | Course - Diploma | | Duration – 14 weeks | | |
| SYLLABUS | | Total Periods - 42+14 (DCS)=56 | | Theory – 42+14 (DCS)=56 hours | | |
| S.N. | Period Nos | Topic | Details | Instruction references | Additional Study Recommended | Remarks |
| 1 | 1 to 12 (L-9 DCS-3) | 1. Wave motion and its applications. | <p>Wave motion, transverse and longitudinal waves with examples.</p> <p>Definitions of wave velocity, frequency and wave length and their relationship, Sound and light waves and their properties,</p> <p>wave equation ($y = r \sin \omega t$) amplitude, phase, phase difference.</p> <p>Principle of superposition of waves and beat formation.</p> <p>Simple Harmonic Motion (SHM): definition, expression for displacement, velocity, acceleration, time period, frequency etc.</p> <p>Free, forced and resonant vibrations and their examples.</p> <p>Acoustics of buildings – reverberation, reverberation time, echo, noise.</p> <p>Coefficient of absorption of sound, methods to control reverberation time and their applications.</p> <p>Ultrasonic waves – Introduction and properties, engineering and medical applications of ultrasonic.</p> | Text Book of Physics for Class XI & XII (Part-I, Part-II) NCERT Delhi, Applied Physics-II by Eagle Prakashan | Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi | |
| 2 | 13 to 21 (L-6 DCS-3) | 2. Optics. | <p>Basic optical laws- reflection and refraction, refractive index.</p> <p>Images and image formation by mirrors, lens and thin lenses, lens formula, power of lens, magnification.</p> <p>Total internal reflection, Critical angle and conditions for total internal reflection.</p> <p>Applications of total internal reflection in optical fiber.</p> <p>Optical Instruments- simple and compound microscope.</p> <p>Astronomical telescope in normal adjustment and their magnifying powers.</p> | | | |
| 3 | 22 to 27 (L-5 DCS-1) | 3. Electrostatics. | <p>Coulomb's law, unit of charge.</p> <p>Electric field, Electric lines of force and their properties.</p> <p>Electric flux, Electric potential and potential difference, Gauss's law.</p> <p>Capacitor and its working, Capacitance and its units. Capacitance of a parallel plate capacitor.</p> <p>Series and parallel combination of capacitors (related numerical), dielectric and its effect on capacitance, dielectric break down.</p> | | | |
| 4 | 28 to 33 (L-5 DCS-1) | 4. Current Electricity. | <p>Electric Current and its units, Direct and alternating current. Resistance and its units, Specific resistance, Conductance, Specific conductance.</p> | | | |

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| 5 | 34 to 40 (L-5 DCS-2) | 5. Electromagnetism. | <p>Series and parallel combination of resistances. Factors affecting resistance of a wire, carbon resistances and colour coding. Ohm's law and its verification, Kirchhoff's laws.</p> <p>Concept of terminal potential difference and Electro motive force (EMF), Heating effect of current. Electric power, Electric energy and its units (related numerical problems), Advantages of Electric Energy over other forms of energy.</p> | | |
| | 41 to 46 (L-5 DCS-1) | 6. Semiconductor Physics. | <p>Types of magnetic materials: dia, para and ferromagnetic with their properties. Magnetic field and its units, magnetic intensity, magnetic lines of force, magnetic flux and units, magnetization. Lorentz force (force on moving charge in magnetic field), Force on current carrying conductor. Moving coil galvanometer; principle, construction and working. Conversion of a galvanometer into ammeter and voltmeter.</p> | | |
| 6 | 47 to 56 (L-7 DCS-3) | 7. Modern Physics. | <p>Energy bands in solids, Types of materials (insulator, semi-conductor, conductor), Intrinsic and extrinsic semiconductors. p-n junction, junction diode and V-I characteristics. Diode as rectifier – half wave and full wave rectifier (centre taped). Photocells, Solar cells; working principle and engineering applications.</p> | | |
| | | | <p>Lasers: Energy levels, ionization and excitation potentials Spontaneous and stimulated emission; population inversion, pumping methods, optical feedback. Types of lasers; Ruby, He-Ne and semiconductor. Laser characteristics, engineering and medical applications of lasers. Fiber Optics: Introduction to optical fibers, light propagation. Acceptance angle and numerical aperture, fiber types. Applications in; telecommunication, medical and sensors.</p> | | |

Teacher Sig. 

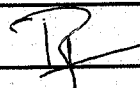
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PLANNED SYLLABUS COVERAGE (Theory)

| G P Kinnaur | | Department: Applied Science | | Subject : Mathematics-II | | |
|-------------------|---------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------|
| | | Course - Diploma | | Duration – 14 weeks | | |
| SYLLABUS COVERAGE | | Total Periods - 70 (56L+14DCS) | | Theory – 70 (56L+14DCS) hours | | |
| Sr. No | Period Nos | Topic | Details | Instruction references | Additional Study Recommended | Remarks |
| 1 | 1 TO 15 (L-14,DCS-4) | 1.Determinants and Matrices | Determinants: Elementary properties of determinants upto 3rd order. Cramer's rule and consistency of equations. Matrix: Algebra of matrices, Inverse of a matrix. Matrix inverse method to solve a system of linear equations in 3 variables. | Mathematics by Dr. RD Sharma , & Engineering Mathematics by N.Ch.S.N lyengar . | Reena Garg, Engineering Mathematics, Khanna Publishing House, New Delhi (Revised | |
| 2 | 16 TO 34 (L-16, DCS-4) | 2.Integral Calculus | Integration as inverse operation of differentiation and integration by substitution Use of formulas integration by,by parts and by partial fractions (for linear factors only) 3 For solving problems where m, n are positive integers Applications of integration for: (a) Simple problem on evaluation of area bounded by a b) Calculation of Volume of a solid formed by revolution of an area about axes. | | | |
| 3 | 35 TO 60 (L-16,DCS-4) | 3.Co-Ordinate Geometry | Equations of straight line in various standard forms (without proof), inter section of two straight lines, angle between two General equation of a circle and its characteristics. To find the equation of a circle, given: * Centre and radius * Three points lying on it * Coordinates of end points of a diameter. Definition of conics (Parabola, Ellipse, Hyperbola) their standard Equations without proof. Problems on conics when their foci, directrices and vertices are given. | | | |
| 4 | 61 TO 70 (L-10,DCS-2) | 4.Differential Equations | Solution of first order method (simple problems). first degree differential equation by variable separation method (simple problems). | | | |



Ravinder Singh
(Lecturer Maths)

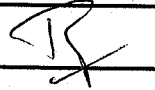
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PLANNED SYLLABUS COVERAGE (Theory)

| G P Kinnaur | | Department: Applied Science | | Subject : Mathematics-II | | |
|-------------------|---------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|--|
| SYLLABUS COVERAGE | | Course - Diploma | | Duration - 14 weeks | | |
| | | Total Periods - 70 (56L+14DCS) | | Theory - 70 (56L+14DCS) hours | | |
| Sr. No | Period Nos | Topic | Details | Instruction references | Additional Study Recommended | |
| 1 | 1 TO 15 (L-14,DCS-4) | 1.Determinants and Matrices | Determinants: Elementary properties of determinants upto 3rd order. Cramer's rule and consistency of equations. Matrix: Algebra of matrices, Inverse of a matrix. Matrix inverse method to solve a system of linear equations in 3 variables. | Mathematics by Dr. RD Sharma , & Engineering Mathematics by N.Ch.S.N lyengar . | Reena Garg, Engineering Mathematics, Khanna Publishing House, New Delhi (Revised | |
| 2 | 16 TO 34 (L-16, DCS-4) | 2.Integral Calculus | Integration as inverse operation of differentiation and integration by substitution Use of formulas integration by,by parts and by partial fractions (for linear factors only) 3 For solving problems where m, n are positive integers Applications of integration for: (a) Simple problem on evaluation of area bounded by a b) Calculation of Volume of a solid formed by revolution of an area about axes. | | | |
| 3 | 35 TO 60 (L-16,DCS-4) | 3.Co-Ordinate Geometry | Equations of straight line in various standard forms (without proof), inter section of two straight lines, angle between two General equation of a circle and its characteristics. To find the equation of a circle, given: * Centre and radius * Three points lying on it * Coordinates of end points of a diameter. Definition of conics (Parabola, Ellipse, Hyperbola) their standard Equations without proof. Problems on conics when their foci, directrices and vertices are given. | | | |
| 4 | 61 TO 70 (L-10,DCS-2) | 4.Differential Equations | Solution of first order method (simple problems). first degree differential equation by variable separation method (simple problems). | | | |

Naresh Kumar
(Lecturer Maths)

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Govt. Polytechnic Kinnaur Camp at Rohru Distt. Shimla (HP)
Department of Applied Science & Humanities

Branch/Semester: Civil & Mech. Engg.

Teacher: Surya Kr. Negi

Subject: Environmental Science

Semester: II

Proposed Course Plan:

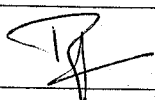
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| Proposed Week | Topic | Instruction Reference | Activity |
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| 1 st Week | Unit-1 Ecosystem Structure of ecosystem, Biotic & Abiotic components Food chain and food web Aquatic (Lentic and Lotic) and terrestrial ecosystem. | S.C. Sharma & M.P. Poonia, Environmental Studies . | Questions for practice. |
| 2 nd Week | Carbon, Nitrogen, Sulphur, Phosphorus cycle. Global warming - Causes, effects, process, Green House Effect, Ozone depletion. | Nazaroff, William, Cohen, Lisa, Environmental Engineering Science | Questions for practice. |
| 3 rd Week | Unit- 2 Air and, Noise Pollution Definition of pollution and pollutant, Natural and manmade sources of air pollution (Refriger- ants, I.C., Boiler) ,Air Pollutants: Types, Particulate Pollutants: Effects and control (Bag filter, Cyclone separator, Electrostatic Precipitator) | Keshav Kant, Air Pollution & Control | Questions for practice. |
| 4 th Week | Air Pollutants: Types, Particulate Pollutants: Effects and control (Bag filter, Cyclone separator, Electrostatic Precipitator). Gaseous Pollution Control: Absorber, Catalytic Converter. | Keshav Kant, Air Pollution & Control | Questions for practice. |
| 5 th Week | Effects of air pollution due to Refrigerants, I.C., Boiler. Noise pollution: sources of pollution, measurement of pollution level, Effects of Noise pollu-tion, Noise pollution (Regulation and Control) Rules, 2000. | Keshav Kant, Air Pollution & Control | Assignment-I |
| 6 th Week | Unit- 3 Water and Soil Pollution Sources of water pollution, Types of water pollutants, Characteristics of water pollutants Tur-bidity, pH, total suspended solids, total solids BOD and COD: Definition, calculation.. | Rao, C. S., Environmental Pollution Control and Engineering | Class Test-1. |
| 7 th Week | Waste Water Treatment: Primary methods: sedimentation, froth floatation, Secondary methods: Activated sludge treatment, Trickling filter, Bioreactor, Tertiary Method: Membrane separation technology, RO (reverse osmosis). | Rao, C. S., Environmental Pollution Control and Engineering | Questions for practice. |
| 8 th Week | Causes, Effects and Preventive measures of Soil Pollution: Causes-Excessive use of Fertilizers, Pesticides and Insecticides, Irrigation, E-Waste. | Rao, C. S., Environmental Pollution Control and Engineering. | Questions for practice. |

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| 9 th Week | Unit- 4 Renewable sources of Energy Solar Energy: Basics of Solar energy. Flat plate collector (Liquid & Air). Theory of flat plate collector. Importance of coating. Advanced collector. Solar pond. Solar water heater, solar dryer. Solar stills. | Aldo Vieira, Da Rosa, Fundamentals of renewable energy processes | Questions for practice. |
| 10 th Week | Biomass: Overview of biomass as energy source. Thermal characteristics of biomass as fuel. Anaerobic digestion. Biogas production mechanism. Utilization and storage of biogas. Wind energy: Current status and future prospects of wind energy. Wind energy in India. Environmental benefits and problem of wind energy. | Aldo Vieira, Da Rosa, Fundamentals of renewable energy processes | Assignment-II. |
| 11 th Week | New Energy Sources: Need of new sources. Different types new energy sources. Applications of (Hydrogen energy, Ocean energy resources, Tidal energy conversion.) Concept, origin and power plants of geothermal energy. | Aldo Vieira, Da Rosa, Fundamentals of renewable energy processes | Class Test-II |
| 12 th Week | Unit-5 Solid Waste Management, ISO 14000 & Environmental Management Solid waste generation- Sources and characteristics of: Municipal solid waste, E- waste, bio- medical waste. | S.C. Sharma & M.P. Poonia, Environmental Studies | Questions for practice. |
| 13 th Week | Metallic wastes and Non-Metallic wastes (lubricants, plastics, rubber) from industries. Collection and disposal: MSW (3R, principles, energy recovery, sanitary landfill), Hazardous. Waste Air quality act 2004, air pollution control act 1981 and water pollution and control act 1996. | S.C. Sharma & M.P. Poonia, Environmental Studies | House Test |
| 14 th Week | Structure and role of Central and state pollution control board. Concept of Carbon Credit, Carbon Footprint. Environmental management in fabrication industry. ISO 14000: Implementation in industries, Benefits. | S.C. Sharma & M.P. Poonia, Environmental Studies | Questions for practice. |

Date: 30-12-2023


Signature of Teacher

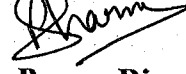
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LESSON PLAN
DEPARTMENT OF APPLIED SCIENCES AND HUMANITIES
GOVERNMENT POLYTECHNIC KINNAUR, SHIMLA, H.P-171207


| Course: Diploma | | Duration: 3 Years | | |
|-----------------------------------------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subject Title: Fundamentals of Electrical and Electronics Engineering | | Session: Jan-May 2024 | | |
| Subject Teacher: Pawan Deyya | | Semester: 2nd | | |
| Total Lectures: 64 | | Lectures: 4/Week | | |
| Week | Chapter to be Covered | Topic to be Covered | Learning Outcomes | Reference |
| 1 st | 1 | Overview of Electronic Components & Signals: Passive Active Components: Resistances, Capacitors, Inductors, Diodes, Transistors and their applications , | Students will learn about the different electrical and electronic components. | 1. Fundamental of Electric circuits by Charles K Alexander and Mathew N O Sadiku. 2. Fundamental of Electrical and Electronics Engineering by S.K.SAHDEV |
| 2 nd | 1 | FET, MOS and CMOS and their Applications. Signals: DC/AC, voltage/current, periodic/nonperiodic signals | Students will learn about the different signals and electronic components. | 1. Fundamental of Electric circuits by Charles K Alexander and Mathew N O Sadiku. 2. Fundamental of Electrical and Electronics Engineering by S.K.SAHDEV |
| 3 rd | 1 | Average, rms, peak values, different types of signal waveforms, Ideal/non-ideal voltage/current sources, independent/dependent voltage current sources. | Students will learn about the various sources ,waveforms and parameters related to it. | 1. Fundamental of Electric circuits by Charles K Alexander and Mathew N O Sadiku. 2. Fundamental of Electrical and Electronics Engineering by S.K.SAHDEV |
| 4 th | 2 | Overview of Analog Circuits: Operational Amplifiers-Ideal Op-Amp, Practical op amp, Open loop and closed loop configurations, | Students will learn about the operational amplifiers. | 1. Fundamental of Electric circuits by Charles K Alexander and Mathew N O Sadiku. 2. Fundamental of Electrical and Electronics Engineering by S.K.SAHDEV |
| 5 th | 2 | Application of Op-Amp as amplifier, adder, differentiator and integrator. Assignment-1 to be allotted. Class Test - 1 to be conducted. | Students will learn about the different applications of op amp. | 1. Fundamental of Electric circuits by Charles K Alexander and Mathew N O Sadiku. 2. Fundamental of Electrical and Electronics Engineering by S.K.SAHDEV |
| 6 th | 3 | Overview of Digital Electronics: Introduction to Boolean Algebra, Electronic Implementation of Boolean Operations, , | Students will learn about the concept of Boolean algebra. | 1. Fundamental of Electric circuits by Charles K Alexander and Mathew N O Sadiku. 2. Fundamental of Electrical and Electronics Engineering by S.K.SAHDEV |

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| 15 th | 6 | Transformer and Machines: General construction and principle of core and shell type of transformers; Emf equation and transformation ratio of transformers; | Students will learn about the basic concept of transformers. | 1. Fundamental of Electric circuits by Charles K Alexander and Mathew N O Sadiku. 2. Fundamental of Electrical and Electronics Engineering by S.K.SAHDEV |
| 16 th | 6 | Auto transformers; Basic principle of Electromechanical energy conversion. | Students will learn about the basic concept of autotransformer. | 1. Fundamental of Electric circuits by Charles K Alexander and Mathew N O Sadiku. 2. Fundamental of Electrical and Electronics Engineering by S.K.SAHDEV |

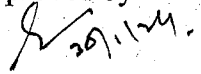
Prepared By


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Lecturer EE
Govt. Polytechnic Rohru

Checked by


Sh. Raman Jamwal
H.O.D.(A.S&H)
Govt. Polytechnic Kinnaur

Approved by


Dr. Puneet Sood
Principal
Govt. Polytechnic Kinnaur